

NASA Langley Research Center is actively seeking partnerships and collaborations to commercialize its Non-Destructive Evaluation of Wire Insulation and Coatings technology.

The Market Opportunities

Applications of this technology include industries where visual inspection of wiring is not practical. This method is also useful for preventive maintenance applications for critical wiring applications where failure of wiring could be costly or mission critical, such as:

- Nuclear power plants
- Military and commercial aircraft
- Marine vessels
- Manufacturing plants

The Benefits

- Wire insulation evaluation may be accomplished in place without having to remove the wire for visual inspection
- Tests integrity and predicts life of installed wiring
- System can be produced using existing ultrasonic sensors and without exotic parts and using existing/known capabilities
- Minimal capital investment required since existing sensors, design techniques, and manufacturing capabilities can be used

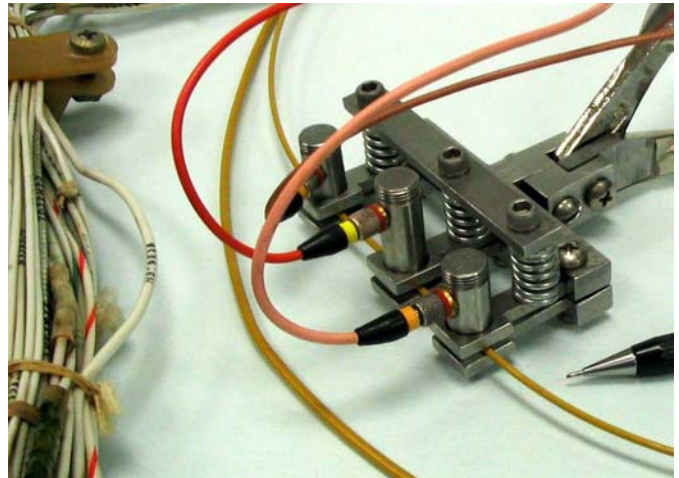
The Technology

Electrical wiring in most modern day equipment is subjected to heat, cold, moisture, chemical insults, abrasion and vibrations, which can eventually cause the wire insulation and even the wire conductor to fail.

The technique of using the ultrasonic phase spectrum to extract material properties of the

Non-Destructive Evaluation of Wire Insulation and Coatings

Aging wire insulation assessment by phase spectrum examination of ultrasonic waves



Wire Insulation Health Monitoring Tool

insulation is being examined. Ultrasonic guided waves will propagate in both the wire conductor and the insulation. Assuming the conductor remains constant, then the stiffness of the insulator can be determined by measuring the ultrasonic guided wave velocity.

In the phase spectrum method, the guided wave velocity is obtained by transforming the time base waveform to the frequency domain and taking the time difference between two waveforms. The result can then be correlated with a database, derived by numerical model calculations, to extract material properties of the wire insulator. Experimental tests on simple models have compared well to numerical calculations.

Additional Information

To discuss in detail how this technology can profit you and your business, please contact:

NASA Langley Research Center
3 Langley Boulevard • Mail Stop 200
Hampton, VA 23681-2199
phone: (757) 864-8881 • fax: (757) 864-8314
e-mail: larcotechinfo@larc.nasa.gov